

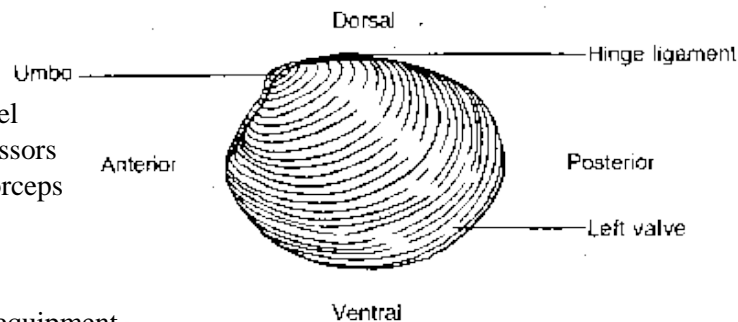
# Clam Dissection Guideline

**BACKGROUND:** Clams are **bivalves**, meaning that they have shells consisting of two halves, or valves. The valves are joined at the top, and the **adductor muscles** on each side hold the shell closed. If the adductor muscles are relaxed, the shell is pulled open by ligaments located on each side of the **umbo**. The clam's **foot** is used to dig down into the sand, and a pair of long **incurrent and excurrent siphons** that extrude from the clam's mantle out the side of the shell reach up to the water above (only the exit points for the siphons are shown). Clams are **filter feeders**. Water and food particles are drawn in through one siphon to the **gills** where tiny, hair-like **cilia** move the water, and the food is caught in mucus on the gills. From there, the food-mucus mixture is transported along a groove to the palps (**mouth flaps**) which push it into the clam's mouth. The second siphon carries away the water. The gills also draw oxygen from the water flow. The **mantle**, a thin membrane surrounding the body of the clam, secretes the shell. The oldest part of the clam shell is the umbo, and it is from the hinge area that the clam extends as it grows.

**I. Purpose:** The purpose of this lab is to identify the internal and external structures of a mollusk by dissecting a clam.

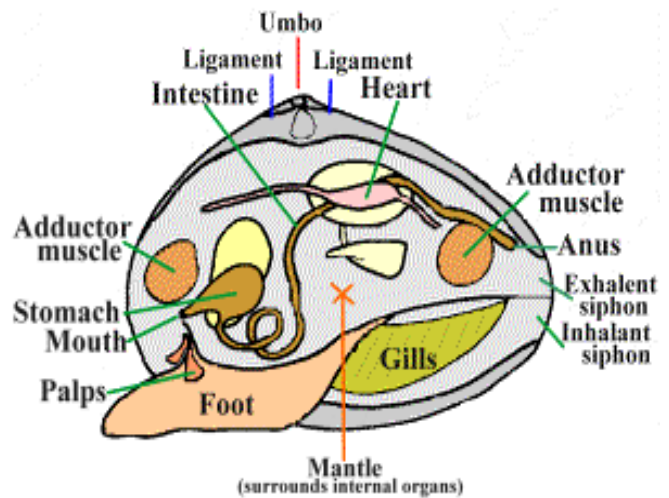
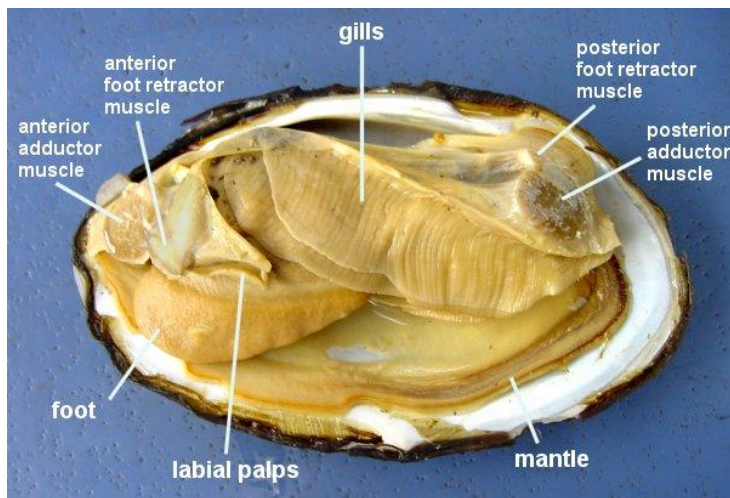
## II. Materials:

- 2 pairs of safety goggles
- 2 pairs of gloves
- 1 preserved clam
- 1 dissecting tray
- 1 paper towel
- 1 pair of scissors
- 2 pairs of forceps
- 2 probes



## III. Procedure

1. Collect your supplies from the front table and put on safety equipment.
2. Locate the **umbo**, the bump at the anterior end of the valve. This should be toward the left end of the clam if it's facing the correct direction (dorsal side up)
3. Identify the **anterior** and **posterior** ends of the clam as well as the **dorsal** and **ventral** surfaces.  
Measure the width of the clam, from dorsal to ventral side \_\_\_\_\_  
Measure the length of the clam, from anterior to posterior \_\_\_\_\_
4. Turn the clam with its dorsal side touching the table and find the popsicle sticks that have been wedged into the ventral end. Use them to help pry the clam open about 2cm.
5. Locate the **adductor muscles**. With your blade pointing toward the dorsal edge, slide your scissors between the upper valve & the top tissue layer. Cut down through both **adductor muscles**, cutting as close to the shell as possible.
6. Bend the left valve back so the clam lies flat in the tray. You may need to disconnect the soft mantle tissue from the left valve.
7. Examine the inner dorsal edges of both valves near the umbo and locate the tooth like projections. Close the valves & notice how the tooth-like projections interlock to create a hinge.
8. Locate the muscle "**scars**" on the inner surface of the left valve. The **adductor muscles** were attached here to hold the clam closed.
9. Identify the **mantle**, the tissue that lines both valves & covers the soft body of the clam.
10. With probe lift the mantle so you can see the **gills**, respiratory structures.
11. Locate two shiny white tubes on the posterior end of the clam. You may need to carefully move the gills to the side to see them. The ventral tube is the **incurrent siphon** that carries water into the clam, and the more dorsal tube is the **excurrent siphon** where wastes & water leave.



12. Observe the **muscular foot** of the clam ventral to the gills. It is attached to the soft **visceral mass**, which contains the other organs. Note the hatchet shape of the foot used to burrow into mud or sand.
13. Locate the **palps**, (mouth flaps) structures that surround & guide food into the clam's mouth. Beneath the palps, find the **mouth**.
14. With scissors cut into the ventral portion of the foot. Cut the muscle into right and left halves. Be careful here to make the halves even!
15. Carefully peel away the muscle layer to view the internal organs inside the visceral mass.
16. Locate the spongy, yellowish **reproductive organs**.
17. Ventral to the umbo, find the **digestive gland**, a greenish structure that surrounds the stomach.
18. Locate the long, white, coiled **intestine** extending from the stomach.
19. Follow the intestine through the clam. Find the area near the dorsal surface that the intestine passes through called the **pericardial area**. Find the dark reddish-brown **heart** in this area.
20. Continue following the intestine toward the posterior end of the clam. Find the **anus** just behind the posterior adductor muscle.

21. Draw a picture of what you see and label the following structures:

- |                    |                 |                       |
|--------------------|-----------------|-----------------------|
| ☛ Umbo             | ☛ Foot          | ☛ Reproductive Organs |
| ☛ Adductor Muscles | ☛ Visceral Mass | ☛ Digestive Glands    |
| ☛ Mantle           | ☛ Palps         | ☛ Intestine           |
| ☛ Gills            | ☛ Mouth         | ☛ Anus                |

#### IV. Data

A. Diagram – See attached diagram

B. Discussion Questions

1. You found a mantle and gills on both valves. Using that as evidence, what kind of symmetry does a clam have?
2. What do the adductor muscles do?
3. What are two things that the mantle is for?
4. Explain how clams obtain nutrients (both food and oxygen)

V. Conclusion – Use your pink sheet to help you with this. There wasn't a hypothesis, so you can skip that part! ☺